AUTHOR INDEX

Numbers in parentheses are reference numbers and indicate that the author's work is referred to although his name is not mentioned in the text. Numbers in *italics* show the pages on which the complete references are listed.

Abbott, D. C., 498(62), *527*
Abbott, R. J., 202(40), *223*
Abou-Chacra, R., 177(54), *181*
Abragam, A., 321(3, 4), 322(3), *387*
Abraham, F. F., 495(21), 499(21), *526*
Abramowitz, M., 51(39), *80*, 230(3), *275*
Adelman, S. A., 4(17, 18), *27*, 156(27), *179*, 233(6), *275*, 424(70), *442*
Afsar, M. N., 302(54), *319*
Akhiezer, N. I., 81(3), *130*, 324(34), *388*
Anderson, J. E., 301(51), 317(51), *319*
Anderson, P. W., 137(9), 149(9), 172(45), 177(45, 54), *179*, *180*, *181*
Andretta, M., 188(30), *222*
Angell, C. A., 278(1, 3, 4), 296(4), 308(65), *318*, *319*
Apfel, A., 295(38), *319*
Arnett, W. S., 503(105), *529*
Arnold, L., 478(7), *491*
Assousa, G. E., 503(104), *529*
Atkins, P. W., 334(48b, 49), 348(48b), *388*
Audouze, J., 510(129), 517(139), *529*

Bach, P., 308(65), *319*
Bagchi, B., 184(19, 20), 203(19, 20) *222*
Baker, G. A., Jr., 87(12), *131*
Balucani, U., 24(35), *27*, 208(47), 209(47), *223*, 239(7, 8), 245(7, 8), 260(7, 8), 267(7, 8), *275*
Balzarotti, A., 137(10), *179*
Baraff, G., 163(37), *180*
Baram, A., 325(43), 348(43), *388*
Baranova, N. B., 219(56), *223*
Barucha-Reid, A. T., 494(11), *526*
Bassani, F., 134(2), 135(2), 161(2), 163(35), *178*, *180*
Beer, N., 161(30), *180*
Belch, A. C., 279(13), 280(19), 282(13), 293(13, 19, 34), *318*, *319*
Bellissent-Funel, M. C., 317(84), *320*
Benoit, H., 183(1), 188(1), *222*
Berne, B. J., 25(37), *27*, 208(46), 217(38), *233*, 399(25), 430(25), *441*
Bernholc, J., 163(36), *180*
Bertolini, D., 301(52), 303(52), 317(83), *319*, *320*
Beveridge, D. L., 281(22), 282(22), 283(22), *318*
Binney, J., 493(8), *526*
Bishop, M., 226(1), *275*
Bixon, M., 23(33), *27*, 105(24), *131*, 154(24), *179*
Black, D. C., 502(92), *528*
Bleaney, B., 358(50a), *388*
Blomberg, C., 398(19), 423(68), *441*, *442*
Blum, L., 334(48d), 348(48d), *388*
Blumberg, R. L., 298(48), *319*
Blumstein, C., 108(29), 122(29), 124(29), *131*
Bochov, G. N., 2(10), *26*
Bodenheimer, P., 502(88, 90, 92), *528*
Boned, C., 316(79, 80), *320*
Boon, J. P., 25(37), *27*, 309(68), *320*
Boss, A. P., 502(90, 91), *528*
Bossi, M., 502(94), *528*
Bossis, G., 187(27), 189(27), *222*, 226(2a-c), 261(2a-c), 262(2a), 263(2a), 264(2a), 267(2a,b), *275*, 304(57), *319*
Bowman, J. M., 402(29), *441*
Brand, H., 3(12), *26*, 410(34), 428(34), 429(34), *441*, 446(3), 458(3), 470(3), *474*
Brent, R. P., 163(34), *180*
Brezinski, C., 81(5), 87(5), 114(5), *131*
Broadbent, S. R., 502(95), *528*
Brooks, C. L., 4(18), *27*
Brot, C., 187(27), 189(27), *222*, 226(2b), 261(2b), 266(2b), 267(2b), *275*, 304(57), *319*

Bruhweiler, F. C., 504(118), *529*
Bucaro, J. A., 298(45), *319*
Buchanan, T. J., 304(58), *319*
Buff, J., 502(89), *528*
Bullett, D. W., 134(6), 140(6), 149(6), 170(6), 176(6), *179*
Bulmer, M. J., 481(29), *481*
Bulsara, A. R., 446(5), *474*
Burnett, M. K., 295(41), *295*
Burstein, D., 504(117), *529*
Burton, J. J., 495(26), 499(26), *526*
Büttiker, M., 4(16), *27*, 396(13), 399(13), 400(13), *441*
Bylander, D. M., 169(41), *180*

Calderwood, J. H., 189(33), 203(33), 205(33), *222*
Carazza, B., 325(44), *388*
Carmeli, B., 399(26), 431(26), 432(84), 433(84a), 434(84), 435(84), 439(84), *441*, *443*
Carnie, S. L., 304(59), *319*
Carolan, J. L., 321(23), 325(23), *387*
Carruthers, T., 451(21), *474*
Cassettari, M., 301(52), 303(52), 317(83), *319*, *320*
Chandler, D., 399(25), 430(25), *441*
Chandrasekhar, J., 280(21), 283(21), *318*
Chandrasekhar, S., 30(1b), *78*, 286(27), *318*, 414(11b), *440*, 493(3), 494(12), *526*
Chapman, C. R., 496(42), *527*
Chaturvedi, S., 32(15b), 48(37), 70(15b), *79*
Chen, S. H., 310(71), 313(71), 317(84), *320*
Cheng, E. T., 321(17), *387*
Chihara, T. S., 114(31), 132
Chiosi, C., 498(61), *527*
Choy, W. T. P., 321(12a), 322(12a), *387*
Christiansen, J. A., 392(10), *440*
Christoffel, K. M., 402(29), *441*
Chu, S. Y., 278(6), *318*
Ciccotti, G., 18(29), 24(29), *27*, 198(39), *222*, 269(16), 271(17), *275*
Clarkson, D., 478(11), *491*
Coffey, W. T., 4(19), *27*, 183(3, 4), 184(5, 6), 186(25), 187(3, 5, 6, 25), 188(5), 189(5, 6, 25, 33, 36), 191(5), 192(4, 5, 6), 193(6), 198(5, 6), 202(4–6), 203(5), 205(33), 212(5), 216(5, 6), 218(3), *222*, *223*, 246(10), *275*, 411(39), 436(39), *441*
Cole, B. J., 324(38b), *388*
Collet, A., 213(51), *223*
Collie, C. H., 314(75), *320*
Comins, N. F., 503(112, 114), 504(119), 508(119), *529*
Conde, O., 279(18), 298(18), 299(18), 303(18), *318*
Coradini, A., 496(39), *527*
Corrsin, S., 451(19), *474*
Courant, R., 82(9), *131*
Cox, D. P., 513(136), *529*
Crossley, J., 316(82), *320*
Cukier, R. I., 230(4), 274(4), *275*
Cyrot-Lackmann, F., 104(21), *131*, 134(3, 4), 139(3, 4, 11), 140(4), 161(4), *179*

d'Agliano, E. G., 431(81), *443*
Dahlborg, U., 310(69), 313(69), *320*
Dale Favro, L., 327(47a), 328(47a), *388*
Damjanovich, S., 434(85), *443*
Dammers, A. J., 325(41), *388*
Danford, M. D., 283(25), *318*
Danninger, W., 298(46), 314(46), *319*
D'Arrigo, G., 295(39), *319*
Davies, C. M., 294(36), *319*
Davis, L., C., 177(51), *181*
De Kepper, P., 412(43), *441*
Dekeyser, R., 325(40c), 378(40c), *388*
Dekker, H., 34(27), *79*
Dempster, E. R., 479(35), *491*
Derosa, M., 226(1), *275*
De Schepper, I., 309(67), *320*
Dianoux, A. J., 317(84), *320*
Dohnanyi, J. W., 496(53), *527*
Dole, S. H., 496(46), *527*
Domb, C., 140(13), *179*
Doni, E., 137(10), *179*
Donn, B., 495(22), *526*
Donnelly, R. J., 398(21), *441*
Donovan, A. F., 122(37), 132
Douglass, D. C., 308(62), *319*
Dow, J. D., 168(39), *180*
Draine, B. T., 495(25, 27), 499(25), *526*
Draux, A., 81(7), 114(7), *131*
Drosdziok, S., 451(14), *474*
Ducastelle, F., 104(22), *131*, 139(11), 161(33), 162(33), *179*, *180*
Duncan, R., 498(65), *528*
Dupre, F., 306(61), *319*
Dupuis, M., 116(35), *132*, 324(36), *388*

Ebner, C., 321(25), *387*

Eckmann, J. P., 494(20), *526*
Economou, E. N., 177(53), *181*
Eddington, A., 493(2), *526*
Edmunds, M. G., 510(130), *529*
Egelstaff, P. A., 313(73), *320*
Eguchi, T., 431(77), *442*
Ehrenreich, H., 176(49), *181*
Eisenthal, K. B., 432(83), *443*
Einstein, A., 29(1a), *78*
Eisemberg, D., 278(9), 295(9), 304(9), *318*
Elmegreen, B., 498(64), 500(76), 501(64, 76), 503(103), *527, 528*
Emerson, M. T., 390(5), *440*
Eneev, T. M., 496(45), *527*
Engelsberg, M., 321(21–23), 325(22, 23), *387*
Evans, G. J., 4(19), *27,* 184(5), 187(5), 188(5), 189(5), 191(5), 192(5), 198(5), 202(5), 203(5), 212(5), 213(53), 214(53), 216(5), *222, 223,* 246(10), *275*
Evans, G. T., 411(39), 436(39), *441*
Evans, M. G., 390(6), *440*
Evans, M. W., 4(19), *27,* 105(25), *131,* 184(5, 6, 14–18, 21, 22), 185(14, 17, 18, 21, 22), 186(22, 24, 25), 187(5, 6, 21, 25), 188(14–18, 24), 189(5, 6, 14–18, 22, 25, 34, 35), 190(14–18), 191(14, 17), 192(5, 6, 15, 22), 193(6, 22), 194(15), 195(14), 196(18), 197(14,18), 198(5, 6, 17, 18), 200(16, 17), 201(16), 202(5, 6), 203(5, 14–18, 25), 204(14, 21), 205(21), 206(15), 208(22), 211(22), 212(5), 213(24), 214(55), 215(14–18), 216(5, 6), 220(14–18), *222, 223,* 246(10), 262(15), 269(15), *275,* 288(29), 300(49), *318, 319,* 325(45), *388,* 411(38, 39), 436(39), *441*
Eyring, H., 390(3, 6c), *440*

Faetti, P., 62(43), *80,* 208(48), 209(48), *223*
Faetti, S., 426(73), 428(73), *442,* 471(43, 44), 472(44), *475,* 478(14, 16), *491*
Falagarone, E., 500(77), *528*
Farinella, P., 496(40, 41, 55), *527*
Farro, L. D., 73(45), *80*
Fauve, S., 453(27), *475*
Fedders, P. A., 321(25), *387*
Federico, C., 496(39), *527*
Feitzinger, J. V., 503(115), *529*
Felsenstein, J., 479(36), *491*
Ferrario, M., 18(28), *27,* 186(25), 187(25), 189(25), 203(25), *222,* 231(5), 266(5), *275,* 317(83), *320,* 323(30), *388,* 419(63), *442*
Ferrini, F., 496(41), 499(73), 501(73, 82), 502(94), 506(125, 127), 508(125), 510(125, 127, 128), 518(125, 127, 128), 525(128), *527, 528, 529*
Festa, C., 471(44), 472(44), *475,* 478(16), *491*
Finch, E. D., 308(65), *319*
Fincham, D., 184(8), *184*
Fleck, R. C., 499(72), *528*
Fleming, G. R., 431(78), *442*
Fonseca, T., 78(47), *80,* 398(15), 402(30), 417(60), 422(15a), *441, 442*
Ford, W. K., 504(116, 117), *529*
Fox, R. F., 5(20), 25(20), *27,* 34(28), *79*
Franco, J., 513(136, 137), *529*
Freed, J. H., 325(40a,b), 334(40a), 378(40a,b, 53), *388*
Freedman, W., 503(113), *529*
Friedman, H. L., 334(48c,d), 348(48a), *388*
Froeschle, C., 496(51), *527*
Fujimoto, M., 503(107), 507(107, 140), *529*
Fujisaka, H., 32(11), *79,* 458(33), 462(33), 471(33), *475,* 478(13), *491*

Gade, S., 321(18), *387*
Galvin, P., 455(32), *475*
Gardiner, C. W., 425(71), *442*
Garrido, L., 33(26), *79,* 63(26), 64(26), 66(26), *79,* 414(49), 417(49), *442*
Garrity, D. K., 399(24), *441*
Gaspard, J. P., 104(21), 124(39), *131, 132,* 134(4), 139(4), 140(4), 141(15), 161(4), *179*
Gautschi, W., 122(36, 38), 124(38), *132*
Geiger, A., 281(22), 293(32), 298(48), *318, 319*
George, C., 1(3), *26*
Gerl, M., 169(40), *180*
Gerola, H., 502(89), 503(108–111, 115), 513(109), *528, 529*
Gershmann, H. R., 358(506), *388*
Giannozzi, P., 103(20), 104(20), 105(20), 116(20), *131*
Gilbert, R. G., 432(82), *443*
Gill, J. C., 321(13), *387*
Gillen, K. T., 308(62), *319*

Gillespie, J. H., 477(3), 478(4), 479(3, 24), 484(3), 489(4, 32), *491*
Giordano, M., 324(35), 342(56), 379(56), *388*
Girlanda, R., 137(10), *179*
Ginzburg, V. L., 494(14), *526*
Glansdorf, P., 2(9), *26*
Glansdorff, P., 478(21), *491*
Gläser, U. H., 161(31), *180*
Glasser, L., 316(82), *320*
Glassgold, A. E., 503(115), *529*
Goldreich, P. G., 496(38), *527*
Golomb, S., 455(29), *475*
Gomes, J. A. N. F., 398(15), 402(30), *441*
Gordon, R. G., 107(26), 109(26), 125(42), *131, 132,* 321(5–10), 322(5–10), *387*
Götze, W., 177(56), *181*
Grabert, H., 7(24b), 20(30b), *27,* 33(19), *79*
Gradsteyn, R. S., 52(41), *80*
Graft, R., 169(42), 170(42), *180*
Graham, R., 3(13), *26,* 410(35), 428(35), *441,* 469(42), 470(42), 471(42), *475,* 478(17), *491*
Grasso, V., 137(10), *179*
Gray, D. F., 494(18), *526*
Grecos, A., 1(4), *26*
Green, C. D., 308(64), *319*
Greenberg, R., 496(42), *527*
Griem, H., 493(10), *526*
Grigolini, P., 2(7), 4(19), 11(7), 18(28), 24(35), *26, 27,* 48(38), 62(43), 67(43), 69(44), 78(47), *80,* 88(13), 105(23), 108(23), *131,* 149(22), 150(23), 155(25), 156(26), 158(25), *179,* 184(5–7, 9–12, 21, 22), 185(9, 21, 22), 186(22), 187(5, 6, 21), 188(5), 189(5, 6, 22), 191(5), 192(5, 6, 22), 193(6, 22), 198(5, 6), 202(5, 6), 203(5, 10, 42), 204(21), 205(21), 206(45), 207(7), 208(22, 47–49), 209(47, 48), 211(22), 212(5), 216(5–7), *222, 223,* 231(5), 239(7, 8), 245(7, 8), 246(10), 260(7, 8), 266(5), 267(7, 8), 274(18), *275,* 317(83), *320,* 321(12c), 322(12c), 323(30, 31), 324(35), 327(31), 342(56), 365(52), 379(56), *387, 388,* 398(15), 402(30), 411(39), 417(60), 419(63, 64), 422(15a, 66), 425(66), 426(73, 74), 428(73), 436(39), 437(86), 438(86), *441, 442, 443,* 466(40), 471(43, 44), 472(44), *475,* 478(14, 16), *491*
Grindlay, J. W., 500(77), *528*
Grossman, S., 458(33), 462(33), 471(33), *475,* 478(13), *491*
Grosso, G., 103(20), 104(20), 105(20, 23), 108(23), 116(20), *131,* 149(22), 155(25), 158(25), 169(42), 170(42), *179, 180*
Grote, R. F., 401(28), 402(28), 411(37), 419(28, 37), 420 (28, 37), 424(37), 431(28), 438(37), *441*
Grunwald, E., 390(1, 5), 392(1), *440*
Guardia, E., 423(69), *442*
Guess, H. A., 478(4), 489(4, 32), *491*
Gunton, J. D., 414(50), 417(50), 429(50), *442*
Gupta, Madhu S., 455(30), 468(30), *475*

Haake, F., 75(23), 78(23), *79*
Haggis, G. H., 304(58), *319*
Haken, H., 2(11), 8(11), 34(29, 30, 31), *79,* 426(75), *442,* 478(23), *491*
Haldane, J. B. S., 479(34), *491*
Hamada, H., 283(24), 296(24), 308(24), *318*
Hamburger, H., 102(19), *131*
Hammersley, J. M., 502(95, 96), *528*
Hänggi, P., 7(24b), *27,* 33(19), *79,* 108(28), 125(43), 127(43), *131, 132,* 414(44, 46, 51), 415(44, 56), 416(44), 417(59, 61), 420(65), 424(65), 425(72), 428(72), *441, 442*
Hansen, E. K., 321(19, 26), 322(19, 26), 325(26), *387*
Harada, K., 452(25), *475*
Hareng, M., 295(42), *319*
Harp, G. D., 208(46), *223*
Harris, E. P., 396(13), 399(13), 400(13), *441*
Hartmann, W. K., 496(42), *527*
Hase, W. L., 391(7), 430(7b), *440*
Hasegawa, H., 33(25), 73(25), 78(25), *79*
Hasha, D. L., 431(77), *442*
Hass, K. C., 176(49), *181*
Hasted, J. B., 302(54), 304(55, 58), 314(75), *319, 320*
Hayashi, C., 495(34), 496(34), *527*
Haydock, R., 89(15), 98(15), 104(15), *131,* 134(5, 6), 140(6), 149(6, 21), 170(6), 176(6), 177(59, 60), *179, 181*
Heiks, H. R., 295(41), *319*
Heine, V., 134(5, 6), 140(6), 146(5), 149(6), 170(6), 176(6), *179*
Helfand, E., 423(67), *442*

Hellyer, B., 496(54, 56), *527*
Hemmer, P. C., 31(4), *78*
Henin, F., 1(3), *26*
Henrici, P., 125(44), 126(44), *132*
Herbst, W., 503(104), *529*
Hertz, H. G., 285(26), *318*
Heslot, F., 453(27), *475*
Hesse-Bezot, C., 304(57), *319*
Hesse-Bezot, P., 187(27), 189(27), *222*
Heyes, D., 184(8), *222*
Hilbert, D., 82(9), *131*
Hill, B. P., 334(48), 348(48), *388*
Hirakawa, D., 452(25), *475*
Hirata, F., 279(12), 282(12), *318*
Hjalmarson, H. P., 168(39), *180*
Hoch, M. J. R., 308(62), *319*
Hochstrasser, R. M., 431(80), *442*
Hochstrasser, U. W., 114(33), *132*
Hodges, C. H., 161(29), 177(61), *180, 181*
Hoekstra, R., 479(37), *491*
Homada, Y., 478(19), *491*
Horn, P. M., 451(21), *474*
Horsthemke, W., 412(43), 414(45), 426(43), *441*, 445(1), *474*, 478(5–10), *491*
Hoyle, F., 499(66), *528*
Hubbard, J., 107(27), *131*
Hubbard, P. H., 288(28), *318*, 327(47b), 375(47b), *388*
Hubble, E. P., 502(97), 504(97), *528*
Huber, D. L., 146(19), *179*
Hudson, J. P., 495(22), *526*
Hunter, C., 499(67), *528*
Hwang, T. Y., 321(27), *387*
Hynes, J. H., 7(24a), *27*
Hynes, J. T., 391(7b), 401(28), 402(28), 411(36, 37), 419(28a, 37), 420(28a, 37), 424(37), 430(7b, 76), 431(28), 438(37), *441, 442*

Iadonisi, G., 163(35), *180*
Ikeuchi, S., 503(107), 507(107, 138), 514(138), *529*
Impey, R. W., 279(16), 280(21), 283(21), *318*
Inaba, Y., 414(45), *441*
Ipatov, S. I., 496(44), *527*
Ippen, E. P., 432(83), *443*
Isaacman, R., 496(47), *527*
Ishii, K., 177(52), *181*
Ito, K., 446(4), *474*
Itsumi, M., 451(17, 20), *474*

Jaccucci, G., 271(17), *275*
Jacques, J., 213(51), *223*
Jarwood, J., 325(45), *388*
Jarzynski, J., 294(36), *319*
Jaykar, S. D., 479(34), *491*
Jeans, J. H., 502(98), *528*
Johari, G. P., 316(81), *320*
Jonas, J., 431(77), *442*
Jones, L. V., 295(41), *319*
Jones, W., 134(1), *178*
Jones, W. B., 81(6), 114(6), *131*
Jorgensen, W. L., 280(21), 283(21), 315(76, 77), *318, 320*

Kaatze, U., 301(53), 302(53), 303(53), *319*
Kabashima, S., 451(12, 13, 15–17, 20), 452(22, 26), *475*
Kambe, K., 321(3), 322(3), *387*
Kaneko, K., 3(14), *27*, 33(22), *79*, 458(34), *475*, 478(18), *491*
Karasudani, T., 13(27), *27*
Kataoka, Y., 283(24), 296(24), 308(24), *318*
Katz, S. L., 414(50), 417(50), 429(50), *442*, 471(45), *475*, 478(15), *491*
Kauffer, E., 169(40), *180*
Kauzmann, W., 278(9), 294(37), 295(9), 304(9), *318, 319*
Kawakubo, T., 451(12, 13, 15–17, 20), 452(22), *475*
Kell, G. S., 296(43), *318*
Kelly, M. J., 134(5, 6), 140(6), 146(5), 149(5, 21), 170(6), 176(6), *179*
Kielich, S., 196(37), 200(37), *223*
Kim, I. M., 325(40c), 378(40c), *388*
Kimball, J. C., 177(55), *181*
Kimura, M., 477(2), 479(2), 481(31), *491*
Kitahara, K., 414(45), *441*, 478(8), *491*
Kivelson, D., 378(54), *388*
Klein, M. L., 280(21), 283(21), *318*
Klyotskin, V. I., 414(47), *442*
Knak Jensen, S. J., 321(19, 26), 322(19), 325(26), 334(48), 348(48a), *387, 388*
Knobloch, E., 494(17), *526*
Koch-Miramond, L., 500(77), *528*
Kogure, S., 452(22), *475*
Kojima, K., 481(26), *491*
Koster, G. F., 168(38), *180*
Kostin, M. D., 399(22), 420(22), 421(22), 422(22), 428(22), *441*
Kramer, B., 177(58), *181*
Kramers, H. A., 4(15), *27*, 30(2), *78*,

Kramers, H. A. (*Continued*) 392(11), 393(11), 394(11), 395(11), 397(11), 399(11), 400(11), 415(11), *440*, 453(28), *475*
Krey, U., 177(57), *181*
Kromhout, R. A., 390(5), *440*
Krynicki, K., 308(64), *319*
Kubo, R., 2(8), *26*, 101(18), *131*, 203(41), *223*, 257(12), 258(12), *275*, 289(30), *318*, 323(29), 326(32), 327(29), 378(20), *388*, 414(52), *442*, 451(18), *474*
Kuhura, S., 452(25), *475*
Kumar, P., 431(81), *443*
Kurth, R., 493(5), *526*
Kuzlov, N. N., 496(45), *527*
Kuzovlev, Yu. E., 2(10), *26*

Lada, C. D., 503(103), *528*
Lado, F., 321(15), 324(15), *387*
Laidler, K. J., 391(8), *440*
Lalli, J., 226(1), *275*
Lambin, P., 124(39), *132*, 141(15), *179*
La Mer, V. K., 390(4), *440*
Lami, A., 184(10), 203(10), *222*
Lanczos, C., 114(34), 119(34), *132*, 142(16–17), 144(16), 145(16), *179*, 325(39), *388*
Landau, L. D., 42(36), *79*
Landauer, R., 4(16), *27*, 32(7), *79*, 396(13), 398(20), 399(13), 400(13), 401(20), 415(20), 423(20), *441*, *442*, 450(9), 451(11), *474*
Lande, R., 481(30), *491*
Lang, E. W., 278(2), *318*
Langer, J. S., 32(8), *79*, 415(55), 423(55), *442*, 495(28), *527*
Larson, K. E., 310(69), 313(69), *320*
Larson, R. B., 499(69), 500(78), 501(78), 511(134), *528*, *529*
Larson, R. S., 399(22), 420(22), 421(22), 422(22), 425(22), 428(22), *441*
Latter, B. D. H., 481(28), *491*
Lavenda, B. H., 34(32), *79*, 400(27), *441*
Leblond, J., 295(42), *319*
Lecar, M., 494(15), *526*
Lee, M. H., 325(40), 378(40), *388*
Lee, P. A., 32(9), *79*
Lefever, R., 414(45), *441*, 445(1), *474*, 478(6–10), *491*
Lefler, J. E., 390(1), 392(1), *440*
Leoncini, M., 258(14), 271(14), *275*
Lepetit, J. P., 316(79), *320*
Leporini, D., 342(56), 379(56), *388*
Leung, K. M., 146(19), *179*
Levine, Y. K., 325(41), *388*
Levy, H. A., 283(25), *318*
Lewis, J. T., 188(32), *222*
Lewontin, R. C., 481(27), *491*
Licciardello, D. C., 177(53), *181*
Lifshitz, E. M., 42(36), *79*
Lin, C. C., 502(99), *528*
Lin, S. H., 390(3), *440*
Lin, S. M., 390(3), *440*
Lindemberg, K., 446(5), 458(37), 466(35–37), 473(46), *474*, *475*
Lindenberg, K., 32(6), *79*, *408(31)*, *441*
Linsky, J. L., 494(18), *526*
Litovitz, T. A., 298(45), *319*
Lombardo, M. P., 208(49), *223*, 239(8), 245(8), 260(8), 267(8), *275*
Long, M. T., 451(21), *474*
Lonke, A., 321(14), 324(14), *387*
Lopez, C., 140(12), *179*
Lowe, I. J., 321(21–24, 27), 322(24), 325(22–24), *387*
Luck, W. A. P., 279(11), 297(11), *318*
Ludemann, H. D., 278(2), *318*
Lugiato, L. A., 78(48), *80*
Lynden-Bell, D., 510(132), 517(132), *529*

Mabuchi, M., 33(25), 73(25), 78(25), *79*
McCaskill, J. S., 432(82), *443*
McClintock, P. V. E., 417(61), *442*, 446(7–8), 453(7–8), *474*, 478(11–12), *491*
McConnell, J. R., 188(32), *222*
McDonald, I. R., 271(17), *275*, 279(16), *318*
Madden, P. A., 279(16), *318*
Madore, B. F., 503(113), *529*
Madura, J. D., 280(21), 283(21), *318*
Magat, M., 301(50), 317(50), *319*
Magni, G., 496(39), *527*
Magnus, A., 124(40), *132*, 161(32), 162(32), 178(32, 63), *180*, *181*
Malek-Mansour, M., 478(5), *491*
Mandelbrot, B. B., 501(80), *528*
Mansfield, P., 321(11), *387*
Marcelin, R., 392(9), *440*
March, N. H., 134(1), *178*
Marchesoni, F., 48(38), 62(43), 67(43), 69(44), 184(21–22), 185(21–22),

186(21–22), 187(21), 189(22), 192(22), 193(22), 204(21), 205(21), 208(22, 48), 209(48), 211(22), *222, 223,* 402(30), 417(59), 422(66), 423(69), 425(66), 426(73, 74), 428(73), *441, 442,* 471(43, 44), 472(44), *475,* 478(14, 16), *491,* 499(73), 501(73, 82), 506(125, 127), 508(125), 510(125, 127, 128), 518(125, 127, 128), 525(128), *528, 529*
Marin, P., 24(35), *27,* 208(47), 209(47), *223,* 239(7), 245(7), 260(7), 267(7), *275,* 324(35), 342(56), 379(56), *388,* 398(15), 422(15a), *441*
Marshall-Coakley, J., 298(45), *319*
Mashiyama, H., 321(20), *387*
Mashiyama, K. T., 32(12, 13), *79*
Martin, F., 213(52), *233*
Mason, S. F., 212(50), 213(50), *223*
Mass, F., 478(11, 12), *491*
Mathieu, R. D., 498(64), 501(64), *527*
Matsuno, K., 450(10), 451(18), *474*
Mausbach, P., 298(48), *319*
May, R. M., 501(81), *528*
Maynard-Smith, J., 479(37), *491*
Mayr, E., 481(33), *491*
Memory, J. D., 321(15, 17), 324(15), *387*
Mestel, L., 499(68), *528*
Mezei, M., 281(22), 282(22), 283(22), *318*
Mihalas, D., 493(6, 8, 9), *526*
Miguel, M. S., 471(45), *475*
Milani, A., 496(48), *527*
Miller, G. E., 496(60), 501(60), 502(60), 510(60), *527*
Mills, R., 308(63), 314(63), *319*
Mizuno, M., 33(25), 73(25), 78(25), *79*
Mogtabai, E., 420(65), 424(65), *442*
Monroe, G. L., 334(48c), 348(48c), *388*
Montgomery, J. A., Jr., 399(25), 430(25), *441*
Montmerle, T., 500(77), *528*
Montroll, E. W., 6(23), *27*
Montrose, C. H., 298(45), *319*
Mookerjee, A., 176(50), *181*
Morfill, G. E., 495(35), 496(35), *527*
Mori, H., 2(6), 11(6), 13(27), *27,* 32(11–13), *79,* 82(11), 88(11), *131,* 134(8), 150(8), *179,* 324(33), 330(33), 331(33), 378(33), *388,* 418(62), *442*
Morimoto, Y., 452(23, 24), *475*
Morita, A., 183(2), 192(2), 197(2), 221(2), *222*
Morita, T., 32(12, 13), *79*
Moro, G., 325(40a, b), 334(40a), 378(40a,b), *388*
Morrison, I., 324(38b), *388*
Morsch, M., 33(21), *79*
Morton, J. B., 451(19), *474*
Moser, J., 494(16), *526*
Moss, F., 417(61), *442,* 446(7, 8), 453(7, 8), *474*
Mouschovias, T. C., 499(71), *528*
Mroczkowski, T. J., 417(61), *442*
Mueller, M. W., 503(105), *529*
Munch, G., 494(12), *526*
Muus, L. T., 8(25), *27,* 59(42), *80,* 334(49), *388*
Myles, C. W., 321(25), *387*

Nagano, K., 13(27), *27*
Nagashima, T., 451(17), *474*
Nakagawa, Y., 495(34), 496(34), *527*
Nakajima, S., 1(5), *26*
Nakanishi, K., 279(17), *318*
Nakano, T., 499(74), *528*
Nakazawa, K., 495(34), 496(34), *527*
Narten, A. H., 283(25), *318*
Negus, D. K., 431(80), *442*
Nevai, P. G., 110(32), 114(32), *132*
Nex, C. M. M., 125(41), *132*
Nicklow, R., 310(71), 313(71), *320*
Nicolis, G., 478(22), *491*
Nishimura, K., 451(12), *474*
Nitzan, A., 399(26), 431(26), 432(84), 433(84), 434(84), 435(84), 439(84), *441, 443*
Nobili, A., 496(48), *527*
Nordholm, S., 19(30a), *27*
Norman, C., 500(75), 513(75), *528*
Norman, M. L., 502(87), *528*
Northrup, S. H., 411(36), *441*
Nose, S., 283(24), 296(24), 308(24), *318*
Nozakura, T., 507(138), 514(138), *529*

Ogan, K., 378(54), *388*
Ogishima, M., 451(15), *474*
Okada, T., 452(22), *475*
Okamoto, H., 13(27), *27*
Onsager, L., 188(28), *222*
Oort, J. H., 493(7), *526*

Orban, E., 295(41), *319*
Ostriker, J. P., 505(121), 517(121), *529*
Oxtoby, D. W., 184(19, 20), 202(40), 203(19, 20), *222, 223,* 431(79), 442

Pagel, B. E. J., 510(130), *529*
Palla, F., 499(70), *528*
Palleschi, V., 471(44), 472(44), *475,* 478(16), *491*
Pantelides, S. T., 163(36), *180*
Paolicchi, P., 496(40, 41, 55), 502(94), *527, 528*
Papadopoulos, N., 177(61), *181*
Paranjape, B. V., 183(4), 192(4), 202(4), *222*
Parco, D., 417(60), *442*
Pareo, D., 78(47), *80*
Parker, E. N., 494(13), 499(13), *526*
Parker, G. W., 321(15, 16), 324(15), *387*
Parsons, S. B., 504(118), *529*
Pastori Parravicini, G., 103(20), 104(20), 105(20, 23), 108(23), 116(20), *131,* 134(2), 135(2), 149(22), 155(25), 156(26), 158(25), 161(2), 169(42), 170(42), *178, 179, 180*
Patey, G. N., 304(59), *319*
Pebbles, P. J. E., 494(19), *526*
Pecheur, P., 169(40), *180*
Pechukas, P., 391(7a), *440*
Pecora, R., 217(38), *223*
Perchernikova, G. V., 495(33), *527*
Perron, O., 92(16), 96(16), *131*
Pettifor, D. G., 161(30), *180*
Peyrelasse, J., 316(79, 80), *320*
Pfluger, P., 125(44), 126(44), *132*
Philip, A. G. D., 497(58), *527*
Piacentini, M., 137(10), *179*
Piaggesi, D., 306(6), *319*
Polanyi, M., 390(6a), *440*
Powles, J. G., 325(44), *388*
Praestgaard, E., 185(23), 189(23), *222*
Preziosi, B., 163(35), *180*
Prigogine, I., 1(2, 3, 4), 2(9), *26,* 478(21, 22), *491*
Pringle, J. E., 495(31), *527*
Provine, W. B., 481(33), *491*
Ptuskin, V. S., 494(14), *526*
Pryce, M. H. L., 321(2), *387*
Pumphrey, N. A., 502(93), *528*

Quantrec, B., 226(2b), 261(2b), 266(2b), 267(2b), *275*

Rahman, A., 278(7), 279(14), 281(7, 23), 292(7), 308(66), *318, 319*
Rapaport, D. C., 279(15), 298(47), *318, 319*
Rehr, J. J., 169(41), *180*
Reid, C. J., 186(26), 187(26), 188(31), 189(26), 190(26), 203(31), *222,* 300(49), *319*
Reinisch, L., 301(50), 317(50), *319*
Rennert, R., 161(31), *180*
Resca, L., 169(42), 170(42, 43), *180*
Resibois, P., 6(22), *27*
Rhodes, W., 11(26), *27*
Ricci, F. P., 306(61), *319*
Rice, S. A., 25(37), *27,* 270(13), 280(19), 282(13), 293(13, 19, 34, 35), *318, 319*
Riseborough, P., 414(44), 415(44), 416(44), *441*
Risken, H., 33(21), *79*
Ritson, D. M., 314(75), *320*
Roberts, M. S., 504(116), *529*
Roberts, P. H., *398*
Roberts, W. W., 502(100), *528*
Rose, M. E., 291(31), *318,* 336(55), 340(55), 379(55), 386(55), *388*
Rosel, F., 108(28), *131*
Rosenfeld, L., 1(3), *26*
Rossitter, V., 213(54), 214(54), *223*
Rossky, P. J., 279(12), 282(12), *318*
Rothenberger, G., 431(80), *442*
Routly, F., 493(6), *526*
Rubin, R. J., 39(35), *79*
Rubin, V. C., 504(116, 117), *529*
Ruzmaikina, T. V., 496(36), *527*
Rybarsch, C., 183(3), 187(3), 192(3), 218(3), *222*
Ryckaert, J. P., 18(29), 24(29), *27,* 198(39), *223*
Ryshik, I. M., 52(41), *80*

Sack, R. A., 122(37), *132*
Safronov, V. S., 495(33), 496(29, 36), *527*
Sagan, C., 496(47), *527*
Salpeter, E. E., 495(25), 497(59), 499(25, 70), 501(59), *526, 527, 528*
Salvetti, G., 301(52), 303(52), 309(53), 317(83), *319, 320*
Sancho, J. M., 33(16–18, 26), 34(17, 18), 63(16–18, 26), 66(16–18, 26), *79,* 414(48, 49, 50, 54), 417(50), 429(50), *442,* 452(26), 478(15), *491*
Sanduleak, N., 498(63), *527*

San Miguel, M., 33(16–18), 34(17, 18), 63(16–18), 66(16–18), 414(48, 50, 54), 417(50), 423(69), 429(50), *442*, 452(26), 478(15), *491*
Sasagawa, F., 3(14), *27*, 458(34), *475*, 478(18), *491*
Sauermann, G., 325(42), *388*
Sawyer, D. W., 308(64), *319*
Scaife, B. K. P., 188(32), *222*
Scalo, J. M., 497(60), 501(60), 502(60, 93), 510(60), *527*
Sceats, M. G., 279(13), 280(19), 282(13), 293(13, 19, 35), *318*, *319*
Schaich, W. L., 431(81), *443*
Schenzle, A., 3(12, 13), *27*, 410(34, 45), 428(34, 35), 429(34), *441*, 458(3), 470(3), *474*, 478(17), *491*
Schenzle, S., 469(42), 470(42), 471(42), *475*
Scheraga, H. A., 279(15), *318*
Schmidt, M., 508(124), *529*
Schnitker, J., 298(48), *319*
Scholl, H., 496(51), *527*
Schroer, W., 183(3), 187(3), 192(3), 218(3), *222*
Schuler, K. E., 446(5), *474*
Schulman, L. S., 503(110, 111), *529*
Schulter, K., 416(58), *442*
Schulton, Z., 416(58), *442*
Schuss, Z., 415(57), *442*
Schwarz, H. A., 390(2), *440*
Schwarzschild, K., 493(1), *526*
Schwarzschild, M., 493(4), *526*
Schwartz, A. J., 495(28)
Seiden, P. W., 503(108–111, 115), 512(135), 513(109), *529*
Serra, R., 34(32), *72*
Seshadri, V., 32(6), *79*, 408(31), *441*, 446(5), 458(35), 446(35–37), 473(46), *474*, *475*
Shakura, N. I., 495(30), *527*
Shank, C. V., 432(83), *443*
Shibata, F., 32(15b), 70(15b), *79*
Shigematsu, H., 32(11), *79*
Shluter, M., 163(37), *180*
Shohat, J. A., 81(4), 103(4), 127(4), *131*
Shore, S. N., 498(63, 65), 503(106), 504(119), 506(106, 123), 508(119), 509(106), 510(123, 128), 513(137), 514(106), 515(106), 517(106), 518(128), 525(128), *527*, *528*, *529*
Shu, F. H., 502(99), *528*
Shuler, E., 230(4), 274(4), *275*
Shulerand, K. E., 466(36), *475*
Silk, J., 500(75), 513(75), *528*
Sinai, J. J., 178(62), *181*
Skinner, J. L., 32(15a), 70(15a), *79*, 398(16), 399(16, 24), *441*
Slater, J. C., 168(38), *180*
Smith, B. F., 503(114), *529*
Smith, B. M., 455(31), *475*
Smith, I. W. M., 391(8b), *440*
Smyth, C. P., 316(81, 82), *320*
Smythe, I., 446(7, 8), 453(7, 8), *474*
Smythe, J., 478(11, 12), *491*
Somogyi, B., 434(85a), *443*
Soven, P., 174(47), *180*
Sparpaglione, M., 105(23), 108(23), *131*, 155(25), 158(25), *179*
Spitzer, L., 493(4), *526*
Sposito, G., 278(6, 8), *318*
Springer, T., 313(74), *320*
Stahler, S., 499(70), *528*
Stanley, H. E., 278(5), 283(5), 293(5, 32), 294(5), 298(48), 301(5), *318*, *319*
Statler, T., 503(114), *529*
Stecher, T. P., 495(22), *526*
Stegun, I. A., 230(3), *275*
Stegun, J. A., 51(39), *80*
Steiger, U. R., 34(28), *79*
Stein, J., 177(57), *181*
Stellingwerf, R. F., 502(89), *528*
Stevens, K. W. H., 321(8), *131*
Stieltjes, T. J., 82(8), *131*
Stillinger, F. H., 278(7), 279(14), 281(7, 23), 292(7), 293(33), 304(56), 308(66), *318*, *319*
Stratonovich, R. L., 31(5), 32(5), *79*, 446(2), 450(2), *474*
Stratonovich, R. L., 408(32), 415(32), 416(32), *441*
Suhl, H., 431(81), *443*
Sumi, H., 172(46), 176(46), *180*
Sunayev, R. A., 495(30), *527*
Sur, A., 321(24), 322(24b), 325(24a), *387*
Suzuki, M., 3(14), *26*, 255(11), *275*, 412(42), *441*, 458(34), *475*, 478(19, 20), *491*
Swalen, J. D., 358(50b), *388*
Swanson, J. A., 32(6), *79*, 398(20), 401(20), 415(20), 423(20), *441*
Szabo, Z., 416(58), *442*

Szebehely, V., 496(50), *527*
Szegö, G., 114(30), *131*

Talkner, P., 7(24b), *27*, 33(19), *79*, 415(56), *442*
Tamarkin, J. D., 81(4), 103(4), 127(4), *130*
Tanaka, H., 279(17), *318*
Taylor, D. W., 174(48), *181*
Teixeira, J., 278(5), 279(18), 283(5), 293(5), 294(5), 298(18), 299(18), 301(5), 303(18), 310(71), 313(71), 317(84), *318*, *320*
Teschke, O., 432(83), *443*
Thomas, H., 33(19), *79*
Thonnard, N., 504(117), *529*
Thouless, D. J., 177(54), *181*
Thron, W. J., 81(6), 114(6), *131*
Thuan, T. X., 505(121), 517(121), *529*
Tinsley, B. M., 505(122), 510(122, 129), *529*
Titulaer, U. M., 33(20, 24), 70(20), 73(24), 78(20, 24), *79*
Timmermans, J., 213(52), *223*
Tognetti, V., 24(35), 208(47, 49), 209(47), *223*, 239(7, 8), 245(7, 8), 260(7, 8), 267(7, 8), *275*
Tohline, E., 502(92), *528*
Tomita, K., 321(20), *387*
Tomlison, G. H., 455(32), *475*
Toomre, A., 502(101), 503(101), *528*
Toyozawa, Y., 172(46), 176(46), *180*
Trautmann, D., 108(28), *131*
Treglia, G., 104(22), *131*, 161(33), 162(33), *180*
Trinh, E., 295(38), *319*
Trulhar, D. G., 391(7b), 430(7b), *440*
Turchi, P., 104(22), *131*, 161(33), 162(33), *180*
Tyon, J. A., 325(41), *388*
Tyrrel, H. J. V., 306(60), *319*
Twarog, B., 510(131), *529*

Uhlendorf, V., 301(53), 302(53), 303(53), *319*
Upgren, A., 497(58), *527*

Vallauri, B., 239(7), 245(7), 260(7), 267(7), *275*
Vallauri, R., 24(35), 208(47, 49), 209(47), *223*, 239(8), 245(8), 267(8), *275*
Van den Berg, S., 504(120), *529*
van Kampen, N., 25(36), *27*
van Kampen, N. G., 32(14), *79*, 189(23), *222*, 257(13), *275*, 327(46), *388*, 397(14), 398(14), 400(14), 412(40, 41), 414(41, 53), *441*, *442*, 446(6), 466(38), *474*, *475*
van Rhijn, P. J., 497(57), *527*
Van Vleck, E. B., 89(14), 90(14), *131*, 160(28), *180*
Van Vleck, J. H., 321(1), *387*
Vega, S., 321(12b), 322(12b), *387*
Velicky, B., 176(49), *176*
Velsko, S. P., 431(78), *442*
Verlet, L., 234(9), 271(9), *275*
Visscher, P. B., 398(18), 399(23), 400(23), *441*
Vogl, P., 168(39), *180*
Vollmer, H. D., 33(21), *79*
Von Blanckenhagen, P., 313(72), *320*
Vulpiani, A., 499(73), 501(73, 82), 506(125), 508(125), 510(125), 518(125), *528*, *529*

Waldek, D. H., 431(78c,d), *442*
Walker, G. H., 495(24), *526*
Wall, H. S., 81(2), 116(2), *130*, 324(37), *388*
Waller, I., 322(28), *387*
Walrafen, G. E., 279(10), 297(10), *318*
Ward, W., 496(38), *527*
Watanabe, H., 183(2), 192(2), 197(2), 221(2), *222*
Watanabe, N., 279(17), *318*
Watt, A., 324(38b,c), *388*
Watt, W., 324(38a), *388*
Weaire, D., 177(58, 61), *181*
Weast, R. C., 295(40), *319*
Weeks, J. D., 230(4), 274(4), *275*
Weidenschilling, S. H., 495(32), *527*
Weiss, G. H., 408(33), 415(333), *441*
Welch, G. R., 434(85a), *443*
West, B. J., 32(6), *79*, 446(5), 458(37), 466(35, 36, 37), 473(46), *474*, *475*
Weston, R. W., Jr., 390(2), *440*
Wetherill, G. W., 496(37, 43), 496(37, 43, 52), *527*
Wheeler, J. C., 108(29), 122(29),

124(29), *131*, 141(14), *179*, 321(10), 322(10), *387*
White, S. S., 517(139), *529*
Whitehead, R. R., 324(38a-c), *388*
Wickramasinghe, N. C., 495(22), *526*
Wilemski, G., 32(10), *79*
Wilen, S. H., 213(51), *223*
Wilkinson, J. H., 145(18), *179*
Williamson, B., 390(4), *440*
Wilson, J. R., 502(87), *528*
Wisdom, J., 496(49), *527*
Wolford, D. J., 168(39), *180*
Wolynes, P. G., 32(15a), 70(15a), *79*, 398(16), 399(16), *441*
Wongtawatnugool, C., 178(62), *181*
Woo, J. W. F., 451(11), *474*
Woolf, L. A., 308(65), *319*
Wray, J. D., 504(118), *529*
Wright, S., 477(1), 481(25), *491*
Wu, S. Y., 178(62), *181*
Wunderlin, A., 34(31), *79*
Wurzbach, W. F., 321(18), *387*
Wynne-Jones, W. F. K., 390(6c), *440*

Yamamoto, T., 283(24), 296(24), 308(24), *318*
Yamazaki, H., 451(13), 452(26), *474*, *475*
Yip, S., 309(68), *320*
Yndurain, F., 140(12), *179*
Yndurain, F. J., 140(12), *179*
Yue, G., 334(38d), 348(38d), *388*

Zang, T. A., 503(102), *528*
Zannoni, C., 326(51), *388*
Zappala, V., 496(55), *527*
Zeldovich, B. Y., 219(56), *223*
Zhelenyi, B. V., 296(44), *319*
Ziabicki, A., 495(23), *526*
Ziman, J. M., 101(17), *131*, 171(44), *180*
Zinnecker, H., 501(79), *528*
Ziv, A. R., 11(26), *27*
Zubarev, D. N., 36(34), *79*
Zundel, G., 298(46), 314(46), *319*
Zvyagina, E. V., 495(33), *527*
Zwanzig, R., 1(1), 6(21), 19(30), 23(32–34), 34(33), 82(10), 105(24), *131*, 134(7), 150(7), 154(24), *179*, 208(44), 207(44), *223*

SUBJECT INDEX

Activation:
  in chemical reaction, 62
  energy, 298
  entropy, 392
  time, 471
  volume, 392, 430
Adiabatic approximation, 135, 402
Adiabatic elimination procedure, 3, 29–80, 188, 208
  applications, 65
  approaches to, comparison of, 77
  creation and destruction operator, 50
  deviation from, 470
  for diffusion-like equation, 70
  division of dynamical operator into perturbation and unperturbed parts, 74
  and Fokker-Planck equation, 78
  history, 29
  and inertia, 470
  and Liouville operator, 61
  mechanical time scale, 65
  and molecular angular velocity, 70
  and Mori theory, 41
  projection operator, choosing best, 73
  slowing down prediction, 471
  stochastic normal modes, 57
  and synergetics, 34
  systematic version, 30
  and Zwanzig projection method, 34
    application of, 44
Agglomeration, 494
  for solar system formation study, 495
Algorithm, for ESR spectrum, 351
Alleles, 480
Alternating fields:
  circularly polarized, 219
  induced transients, 200
Ammonia, 402
Amplitude randomness, 202
Analog simulation, 453
  functions, 454
Anderson model, 172
Anderson's localization theory, 178
Angular coordinates, 246
Angular momentum, 199
Angular velocity:
  equilibrium distribution, 269
  and translation, 246
Angular velocity autocorrelation, oscillation envelopes, 205
Angular velocity decay, effects of excitation, 272
Annihilation operator, 244
  definition, 249
Anticommutation operator, 339
Arrhenius factor, 416
Arrhenius fitting curve, 297
Asteroid, 496
Astrophysical stochastic models:
  adiabatic elimination procedure application, 518
  mathematical treatment, 517
  two-phase, 518
Astrophysical stochastic processes, 493
  coagulation calculations, 495
  initial mass function, 497
  percolation models, 502
  solar system formation, 495
  sticking probability, 495
Astrophysics:
  dust formation, 495
  nucleation phenomena, 495
Atmosphere, stellar, 493
Atomic energy levels, 136
Atomic orbitals, 135
Atom-solid collisions, 156
Augmented space techniques, 176
Autocorrelation function, 97
  angular velocity, 266
  dipole correlation, 290
  excited, decay of, 239
  first-order mixed, 198
  individual dipole, 266
  Kirkwood factor, 304
  Laplace transform, 98

Autocorrelation function (*Continued*)
non-Gaussian properties, 237
rotational kinetic energy, 266
Auxiliary matrix, 107
Average *t*-matrix approximation, 172
Averaging, 18, 176
Axial g-splitting tensor, 362

Bessel function, 231
Bidimensional dipolar potential, 262
trans-1, 1′-Biindanylidene, 431
1, 1′-Binaphthyl, 432
Binary alloys, 176
Binomial distribution, 284
Biological systems:
macroscopic properties, 480
microscopic variables, 480
Biorthogonal basis set, 11, 12, 52
Biorthogonal sets, 81
Birefringence, 190
Birefringent liquid, 202
Bloch function, 168
Bloch theorem, 133
Bohr magneton, 336
Boltzmann distribution, 33
Boltzmann equilibrium, 396
Boson operator, 34
Boundary conditions, 187, 233
Boundary phenomena, 295
Brownian motion, 29, 187
linearization, 420
in *N*-potential wells, 189
rigorous derivation of, 39
two-dimensional rotational, 187
Brownian particle, 228
diffusion in double-well potential, 464
and higher potential energy, 466
sec-Butyl chloride, 214

Calderwood/Coffey itinerant oscillator, 189
Canadines, 213
Canonical constraints, 72
Canonical equilibrium distribution, 70, 185, 208
Cayley-tree lattice, 177
Chaotic radiation field, 62
Chapman-Enskog expansion, 33
Chemical evolution, 494
Chemical reaction(s):
cage effect, 390
damping rate, 390
exchange reaction, 401
multimodal theories, 400
noise-activated reactions, 411
photoactivated, 425
solvent interaction, 389
stochastic interactions, 390
thermalized system, 409
Chemical reaction activation:
by electromagnetic excitation, 425
thermal, 429
Chemical reaction rates, 186
in condensed phase, 389
and decoupling effect, 438
escape time, 422
and external radiation field, 411
and friction, 434
non-Markovian effects, 411
and reduced model theory, 439
and system instability, 414
viscosity dependence, 390
"Chiral discrimination," 212
dynamical effect, 218
effect on equilibrium, 214
external torque, effect, 216
Chiral molecules, 186
field effects, 212
interaction potential, 212
rotation-translation coupling, 219
supercooled, 214
2-Chlorobutanes, 213
Christoffel-Darboux relation, 114
Circuit resistance, 451
Circular permutation, 71
Classical mechanics, 489
Celbsch-Gordan coefficients, 340
Cluster method, 141
Coagulation phenomena, 494
Coherent potential approximation, 172
and recursion method, 174
Collisional dynamics, 496
Collision-induced line broadening, 212
Collision rules, 496
Collision theory, 390
Commutation rule, 50, 248
Complex constants, 91
Complex numbers, 88
Computer simulation:
algorithms, vectorization of, 189
basic techniques, 189
comparison with stochastic theory, 197
of equilibrium properties, 261

external force fields on molecular liquids, 188
of Lennard-Jones system, 233
for molecular rotation, 188
of nonequilibrium properties, 261
and non-Gaussian statistics, 193
and non-Markovian statistics, 193
for rise and fall transients, 192
for validity of fluctuation-dissipation theorem, 192, 206
Continued fraction(s):
accessible parameters, 89
algebraic properties, 82–85
analytic theory, 82
approximant, 83, 119
coefficients, 127, 159
damped oscillation, 161
contraction, 84
convergence, 89
and correlation functions, 82
definitions, 82–85
elementary analytic properties, 85–91
equivalence transformations, 83
and error bounds, 124
even parts, 84
expansion, 66
extension, 84
and Green's function, 96
and Hermitian superoperator, 104
infinite, 83
Jacobi-type, 88
and moments, 104
odd part, 84
and orthogonal polynomials, 110
relations with, 116
power series, relation with, 91–96
and relaxation superoperator, 104
second-order truncation, 471
S-fraction, 85
Stieltjes-type, 85, 126
in theory of relaxation, 81-132
Continued fraction procedure (CFP):
for nonequilibrium process, 23
and nonlinear itinerant oscillator, 208
Contracted distribution, 32, 449
Convergence theorem, 89
Copper chloride-morphine complex, 358
Copper complexes:
absorption spectra, 359
ESR spectrum in solution, 357
Correlation functions, 8, 9
autocorrelation, 97
and continued fraction, 82
crosscorrelation function, 98
of dissipation operator, 128
and error bounds, 128
excited, 260
Laplace transform of, 39
macroscopic, 292
memory function equation, 98
nonexponential behavior, 24
nonstationary, 209
normalized, 23
optical anisotropy, 298
and spectral density theorem, 101
and Volterra equation, 153
Correlation operator, 9
Correlation time, 42
finite, 33
Cosinal itinerant oscillator, 187
Cosine potential, 261
Cosmic rays, 494
Coupled double-well oscillator, 402
Creation operator, 50, 68, 244
definition, 249
Cross-correlation function, 98, 185
Cross-correlation matrix, 213
Crystal:
defect potential, 165
imperfect, density matrix, 166
static dielectric constant, 170
symmetry, 160
translational symmetry, 125
Crystalline periodicity, 172
Cumulant method, 77
Cyclohexane, isomerization, 431

Damped oscillation, 161
Damping, 76
effective, 254, 257
Debye equation, 73
Decay acceleration, 262
Decoupling effect, 184, 200, 438
Grigolini, 185, 187, 204
in quasi-Markov limit, 203
Deexcitation effect, 184, 185, 187, 202, 206
numerical, 211
preparation effect, 207
Delta-function, 102
Density:
and continued fractions, 82
equilibrium, 485

Density (*Continued*)
fluctuation, 236
oscillations, 263
Density wave theory, 502
Depolarization process, 273
Depolarized light scattering, 202
Depolarized Rayleigh scattering, 298
Destruction operator, 50
Determinant formula, 83, 86
Determinants, elementary properties, 148
Diagonal disorders, 171
Diagonalization procedure, 300
Diagonal matrix elements, 97
Dielectric relaxation, 186, 198, 290
Diffusion:
approximation, 67
nonlinear equations, 211
reorientational, 357
tensor, 331
Diffusion coefficient, pressure dependence, 308
Diffusion operator, 367
Dimensionless variables, 421
Diode oscillations, 450
Diphenylbutadiene, 431
Diploid population, 479, 481
Dipole-dipole interaction, 186
Dipole moment, 195
Dipole orientation, accelerated decay, 269
Dirac δ distribution, 102
Directional selection, 487
Disk, protoplanetary, 495
Dissipation operator, 125
correlation function, 128
Dissipative processes, 212
Distribution function:
and real numbers, 102
for star formation, 498
Double-well potential:
Brownian particle diffusion in, 464
electronic circuit, 453
Double-well potential, fluctuating, 457
Dust formation, 495
Dynamical operator, 5, 64, 447
division of, 73
Dynamic structures in water:
structure D, 279
structure I, 278
structure V, 279
Dyson identity, 99
Effective potential:
in population genetics, 488
and relaxation time, 489
Eigenvalues, continuous distribution, 102
Eigenvectors, 51, 118
Einstein theory, 286
Electric dipole, 204, 426
Electric polarization, 273
Electrical circuit, additive stochastic force, 468
Electromagnetic field, frequency, 426
Electron band structure, 134
Electronic diffusion, in random crystals, 177
Electronic paramagnetic resonance spectroscopy, 322
general theory, 326
in liquid state, 323
and Padé approximation, 325
Electronic spin operators, 332
Electron potential, 135
Electron propagation, 138
Enantiomers:
of fluorochloroacetonitrile, 220
racemic mixture of, 186
Energy diffusion process, 394
Energy equipartition relationship, 229
Energy and spacetime, 494
Entropy, 294
molar, 295
Environment:
autocorrelation, 490
random fluctuations, 490
variability, 483
Environmental deviation:
in genetics, 480
and genotypic values, 482
Enzyme chemistry, 434
Equation of motion, 4
for rotational diffusion, 290
Equilibrium:
correlation function, 257
field-on, 184
Equilibrium distribution, 5
canonical, 70, 185, 208
Equilibrium probability distribution, 10
Equipartition principle, 37
Equivalence transformation, 83
Error bounds, 119
averages of positive definite functions, 125
and continued fractions, 124

and correlation function, 128
and Gaussian quadrature, 127
theory of, 125
truncation of continued fraction, 125
Euler angles, 288
Excitation-relaxation process, 25
Excitation resonance, 134
Excited autocorrelation function, 239
Excitons, Frenkel theory of, 138
Exponential, time-ordered, 8

Factorization, 66
Fall transient, acceleration of, 212
Favro equation, 73, 327
Fick's law, 309
Field effects, in chiral molecules, 212
Field-on angular velocity, 199
Field-on equilibrium, 184
distribution, 210
Field-on molecular dynamics, 184
Field stars, 497
Finite autocorrelation time, 67
Finite correlation time, 33
Finite inertia, 463
Fitness (population genetics), 480
calculation, 483
and phenotype score, 481
Fluctuation, non-white, 489
Fluctuation-dissipation theorem, 23, 184
Fluorochloracetonitrile, 220
Fokker-Planck approach, molecular dynamics, 24
Fokker-Planck equation, 2, 504
adiabatic elimination procedure, 3
nonlinear problems, 23
for nonlinear system, 61
non-Markovian process, 65
reliability, 78
rigorous derivation from Newton's deterministic law, 34, 39
time-scale separation between system and thermal bath, 61
Fokker-Planck operator, 67
derivation by dynamical operator, 71
Formal scalar product, 116
Fourier transformation:
of far-infrared spectra, 191
inverse, 324
Fragmentation, 494
as multiplicative stochastic process, 501
as source of star formation, 499
Fragmentation model, nonlinear hydrodynamical, 503
Fragmentation spectrum, 501
Frame transformation, 197
Fredholm determinantal equation, 168
Frenkel theory of excitons, 138
Friction, 187
coefficient, 61, 185, 390
and viscosity, 430
Friction intensity, in strong memory region, 433

Galactic differential rotation rate, 502
Galactic evolution, 493
modeling, 504
one-zone model, 505
Galactic system, metallicity evolution, 497
Galaxy, 494
disk, 502
disk metallicity, 515
integrated luminosity, 504
morphology, 505
star formation history, 505
star formation rate, 505
stochastic models, 503
total gas content, 504
Guassian equilibrium, 63
Gaussian quadrature, 120
and error bounds, 127
weight of, 119
Guassian white noise, 30
definition, 40
Gene frequency, 450
changes in diploid populations, 489
decay, 487
equilibrium density, 485
Fokker-Planck type equation for, 479
intermediate values, 489
and "reduced" model theory, 479
stationary distribution, 488
Genes, 480
biallelic, 481
heterozygosity, 481
Genetic model, 450
Genetics:
and environmental deviations, 480
Ito-Stratonovich, 477
quantitative, 480

Genetic variance, 481
Genotype fitness, autocorrelation, 484
Genotype and phenotype, 450, 480
Gordon algorithm, 107
Gravitation, 494
  clumping, 496
  instability, 495
  interactions, 496
Green's function, 96
  asymptotic behavior, 159
  continued fraction expansion, 148
  damped oscillations, 161
  determination by moment method, 139
  Dyson equation, 152
  formulation for impurity problem, 163
  Herglotz property, 104
  off-diagonal matrix elements, 149
  and recursion method, 146, 148
  and spectral density, 165
  undamped oscillation, 161
Grigolini decoupling effect, 185, 187, 204
Group theory, 133
Gunn diode, 451

Halo stars, 515
Hamburger sequence, 102
Hankel determinant, 91, 102, 104, 111
  algorithms for, 104
  as complex numbers, 103
  modified, 92, 112
Haploid infinite population, 481
Harmonic approximation, 137
Harmonic expansion of potential, 467
Harmonics, spherical, 337
Heat conduction equation, 479
Heisenberg representation, 2
Herglotz property, 100
  and Green's function, 104
Hermitian assumption, 11
Hermitian operator, 96
  projected density of states, 101
  properties, 100
Hermitian polynomials, 33, 51
Hermitian superoperator, 104
Heterozygosity, 479
Heterozygotes, fitness, 481
Hilbert theory of infinite matrices, 82
Homozygotes, 481
Hubbard operator, 375
Hydrogen bond:
  in alcohols, 315
  binomial distribution, 283
  bond-breaking energy, 282
  connectivity, 293
  in D_2O, 314
  definition, 280
  directional nature, 293
  energetic definition, 280
  in ethanol, 315
  formation, activation energy for, 298
  geometric definition, 280
  lifetime, 298
    temperature dependence, 299
  master equation, 285
  mean energy, 282
  mean life time, 279
  in methanol, 315
  model, 293
  probability, 279
  probability calculation, 294
  statistical description, 281
Hydrogen bond dynamics:
  model, 284
  and non-Gaussian properties, 309
  parameters, 292
  and reduced model theory, 286
Hydrogen-bonded liquids, dynamic properties, 277
Hyperpolarizability, 195
Hysteresis, 186

Idempotent property, 12
Identity operator, 50
  eigenvalue, 51
Impurities, in silicon, 169
Impurity problems, 163
  extended impurities, 169
  localized, 167
  many-valley interference effect, 170
  self-consistency, 166
  surface impurity, 170
  vacancies and self-interstitials, 169
Impurity subspace, 164
Incoherent inelastic scattering, 202
Inertia, 67
  and adiabatic elimination procedure, 470
  finite, 463
  influence on EPR spectra, 327
  role in population genetics, 481
Inertial effect, 188
  and diffusional theory, 189
Inertial regime, 219

Infinite chain of states, 205
Infinite order perturbation theory, 177
Infrared/radio-frequency double resonance, 212
Initial mass function, 497
  mass spectrum, 497
Integrated circuits, 186
Integrated computer circuits, 188
Integro-differential equation, 98
Interaction potential, 212
Intermolecular collisions, 212
Intermolecular pair potential, 214
Interstellar clouds, 499
Interstellar gas, 507
Inverse lamb dip spectroscopy, 212
Inverse Laplace transformation, 21
Ionization potential, 168
Irreversibility, 1
Isomerization rate, solvent viscosity dependence, 431
Isothermal compressibility, 294
Itinerant oscillator, 205
  hard-potential, 260
  nonlinear, 207, 246
  sinusoidal potential, 260
  soft-potential, 260
Itinerant oscillator theory, 189, 203
Ito-Stratonovic controversy, 468, 470
  among genetists, 477

Jahn-Teller systems, 138
Jeans mass, 499
J-fraction, 88
Josephson tunneling junction, 186

Kerr constant, 198
Kerr effect theory, 200
Kielich function, 185, 197
Kinetic energy, 199
Kolmogorov-Arnold-Moder theory, 496
Kolmogorov forward equation, 477
Koster-Slater equation, 168
Kramers equation:
  numerical solution, 187
  rate of escape, 468
Kramers theory of chemical reactions, 93, 392
  bistable model, 397
  coupling between reactive and nonreactive modes, 403
  for diffusional cases, 420
  generalization, 402
  multidimensional core, 423
  multimodal case, 400
  noise activated reactions, 411
  reaction rate, 394
Kramers-Moyal expansion, 32
K-space method, 133, 138

Laboratory frame of reference, rototranslational correlations, 221
Lactic acids, 213
Lagrange interpolation polynomial, 121
Lagrangian, nonlinear, 501
Laguerre polynomial, 114
Lanczos algorithm, 145
Lanczos method, 142–146
  applications, 146
  biorthogonal set, 145
  and electronic paramagnetic resonance spectroscopy, 325
  minimization process, 144
  and orthogonality, 144
Landau theory, 451
Langevin equation, 4
  generalized, 21
  one-dimensional stochastic differential type, 63
  and reduced model theory, 63
  time evolution, 13
  time-scale separation, 43
  two-dimensional stochastic differential type, 66
Langevin function, 185
  high-order, 195
Laplace transform, 15
  and continued fraction procedure, 486
  inverse, 21
Laser-induced birefringence, 202
Laser-induced far-infrared absorption, 192
Lattice dynamics, 134
  anharmonicity effects, 156
  basic equation, 137
  defects, 163
  diagonal disorders, 171
  phonon thermal bath, 156
Least squares, 142
Legendre polynomials, 114, 362
Lennard-Jones potential, 233
Lennard-Jones systems, 226
  algorithm, 234
  computer simulation, 233

Lennard-Jones systems (*Continued*)
equation of motion for, 233
nonlinearity, 232
Lifshitz bounds, 178
Light scattering, depolarized, 202
Linear approximation, 72
Linear combination of atomic orbitals, 135
overlap-reduced tight binding method, 137
tight-binding Hamiltonian, 136
Linear oscillator, 76
Linear reduced model, 231
Linear response theory, 257
breakdown, 258
deviation from continued fraction procedure, 258
non-Gaussian properties, 274
Liouville equation, 2, 5
Liouville operator, 5
and adiabatic elimination procedure, 61
Liquid:
intermolecular forces, 188
internal fields, 188
molecular dynamics, 4
Liquid-phase anisotropy, 192
Localization, in disordered system, 177
Lorentz forces, 202
Lorentzian curve, 377
Low-mass protosolar nebula models, 495

Magnetic field pseudo-vector, 202
Magnetic relaxation, quantum statistical theory, 325
Magnetic resonance, absorption curve, 321
Magnetic tensor, 331
Markovian-Fokker-Planck equation, perturbation reduction, 415
Markovian stochastic processes, 25
Markovian truncation, 125
Master equation, 495
Maxwell distribution, 236
Mean field approximation, 177, 210
Memory effects, 188
Memory function:
formalism, 149
and Gordon algorithm, 107
methods, 105, 133-181
application in periodic solids, 163
comparison to Lanczos method, 154
illustrative example, 157
Lanczos method, 142
moment method, 139
recursion method, 146–149
moments of, 105
nonlinear system, 207
Memory intensity, 252
Memory kernel, 9
Memory strength, 372
Metallicity, 497
Microcrystals, 134
Microscopic time, 42
Mode-locked laser, 216
Mode-mode coupling theories, 309
Molar enthalpy, 295
Molecular angular velocity, 70, 184
autocorrelation function, 185
Molecular clouds, rotation, 502
Molecular diffusion tensor, 327
Molecular dynamics, 183
in liquid state, 24
standard observations, 237
velocity correlation function, 237
Molecular inertia, 71, 327
effect on ESR spectra, 372
influence on equilibrium properties, 461
spectroscopic effects, 334
Molecular liquid state, 183
effect of external forces, 184
far-infrared spectra, 189
mathematical model, 186
nonlinearity, 184
rotation-translation coupling, 186
Molecular orientation, 326
and electronic spin, 328
equilibrium distribution, 362
and nuclear spin, 328
Molecular polarizability tensor, 196
Molecular rotational motion, 188
Molecular velocity:
distribution, 235, 236
and thermal equilibrium, 372
Moment method, 134, 158
definition, 139
instability aspects, 141
modified moment, 141
spectral moments, 139
Moment-of-inertia, 190
Moment problem, 96
classical, 96, 100–103
determined, 102
Hamburger, 96
solution, 102
relaxation, 103

Stieltjes, 96
undetermined, 102
Moments, 99
as complex numbers, 103
and continued fractions, 104
evaluation of, 141
modified, 105, 123
orthogonal polynomials, 110, 122
number of, 104
spectral, 321
Moments of distribution, 460
analytical expression, 462
Moment theory, 322
Monte Carlo statistical method, 315, 494
Mori basis set, 204
Mori continued fraction, 188, 229
Mori projection method, 2, 10–24
biorthogonal basis set, 11
for equilibrium state, 23
Hermitian assumption, 11
Rhodes spectroscopic basis set, The, 11
Mori theory, 11, 330
auxiliary variables, 22
for deriving equations of motion, 32
general structure, 22
standard, 22
Morphogenesis, 494
Moving-frame component, 199
Moving frame matrix, 213
Moving frame of reference, 197
Multimodal theories, of chemical reactions, 400
Multiple scattering, 173
Multiplicative noise, role in self-organizing living system, 478
Mutation (genetics), 479

Natural ecosystem, 487
Natural selection, 480
Newton equation, 227
Newton's deterministic law, 35
Nitroxide spin radical, 334
Noise asymmetry, 485
Noise generator, 455
electronic circuit, 456
Noise-induced phase transitions, 445, 459, 478
Noise intensity, 485
Nonequilibrium process thermodynamics, 478
Nonequilibrium stationary state, 423
Nonequilibrium statistical thermodynamics, 430
Non-Gaussian properties, and hydrogen-bond dynamics, 309
Nonlinear excitation, 258
Nonlinearity, 184
parameter, 260
role in liquid molecular dynamics, 225
in stochastic equations, 207
Nonlinear molecular dynamics, under intense force fields, 198
Nonlinear potential, effective, 241
Nonlinear statistics, 274
Nonlinear two-dimensional itinerant oscillator, 186
Non-Markovian effects, on reaction rates, 411
Non-Markovian noises:
external, 412
telegraphic, 415
Non-Markovian process, Langevin-Fokker-Planck method, 25
Non-Markovian properties, 4
Nonpolar solution, 287
Normalization constant, 37
Normalization factor, 235
Normalized fall transient, 185
Normal mode technique, 57
Novikov's theorem, 34
Nuclear angular moment, 331
Nuclear magnetic resonance spectroscopy, 323
Nuclear spin operators, 331
Nuclear Zeeman Hamiltonian, 335
Nucleation phenomena, 495

Off-diagonal matrix elements, 98
One-dimensional conductors, 188
One-dimensional system, 227
Lennard-Jones chains, 232
thermalization, 236
One-electron approximation, 135
Ontogenetic development, 483
Optimal phenotype, 481
Order parameter, 363
and spherical harmonics, 365
Orientation:
autocorrelation function, 184
correlational function, 372
fall transient, 184
potential, 327

Orientation-dependent potential, 263
Orienting field intensity, 370
Ornstein-Uhlenbeck noise, 414, 424
Ornstein-Uhlenbeck process, 34
Orthogonal polynominals:
  Christoffel-Darboux relation, 114
  definition, 110
  Gaussian quadrature, 119
  linear combination, 113
  and modified moment, 122
  monic, 122
  and orthonormality, 112
  properties, 110–124
  Sturm sequence, 114
Orthonormal polynomials, 111
  recurrence formula, 112
  recurrence relation, 117
Orthonormal set, 110
Orthonormal states, 146
Oscillating magnetic field, 358
Oscillations, coherent, 504

Padé approximants, 87, 155
Padé approximation, and electron spin resonance, 325
Parabolic spectral density, 107
Paramagnetic ions, diffusion, 357
Paramagnetic species, 334
  axial g-splitting tensor, 362
  diffusion constant, 360
  ESR lineshape hyperfine intersection, 367
  in triplet spin state, 349
  zero field splitting, 366
Parametric oscillator, 452
Parity-reversal symmetry, 202
Parity rule, 198
Percolation, 494
Percolation models, in astrophysics, 502
Periodicity, 133
Perturbation energy, 194
Perturbation expansion, 77, 259
Perturbation parameter, 76
Perturbation technique, 42
Phase space, asteroids distribution, 496
Phase-space conditional probability density function, 187
Phase transitions, 451
  noise induced, 478
Phenotypic value, 482
Photoactivated chemical reaction, 425
Planetary system formation, 502
Polarizability, 195
Polycrystalline material, 357
Polymer dynamics, 23
Polymers, activated, 188
  soliton diffusion, 190
Polymorphism, 479
Polynomials:
  Hermitian, 33, 51
  Lagrange interpolation, 121
  Laguerre, 114
  Legendre, 114, 362
  orthogonal, 110–124
  orthonormal, 11, 117
Population density, maximum, 489
Population ecology, 494
Population genetics, 477
  basic formula, 478
  effective potential concept, 488
  fitness, 480
  model, 478
  optimum models, 481
  relaxation time, 485
  selection coefficient, 479
  selection intensity fluctuation, 479
Potential:
  and equilibrium density, 489
  harmonic expansion, 467
  linearization of, 465
  minimum, and maximum population density, 489
  sinusoidal, 245
  two-dimensional, 402
Power moments, 97, 102, 122, 139
Power series:
  convergence, 91
  expansion into J-fraction, 94
  expansion into S-fraction, 91
  relation with continued fraction, 91–96
Probability density, for gene frequency, 479
Probability distribution, 7, 31
  relative maximum, 452
Probability function, 67
Projection operator, 5, 38
  definition, 9, 150
  standard, 76
  technical difficulty, 75
  time-independent nature, 45
Projection techniques, 134
  biorthogonal basis set, 156

Quadratic curve, 481

Quantum-mechanical Liouvillian superoperator, 326
Quasi-elastic neutron scattering, 309, 310
Quasi-stationary state, 423

Radiationless decay, 184
Random fluctuation, 487
  selection, 477
Random forces, 150
"Random jump" model, 313
Random phase, 7
Random sampling, 477
Rate constant, 397
  for excited system, 403
  for system in thermal equilibrium, 403
Rayleigh scattering, depolarized, 298
Reaction coordinate, 62, 400
Recurrence formula, 86
Recursion algorithms, 104
  Gordon algorithm, 107
  memory function formalism, 105
  P-algorithm, 108
  product-difference algorithms, 106, 155, 140
Recursion formula, 378
Recursion method, 134, 146–149
  for binary alloys, 176
  chain-model variables, 146
  and coherent potential approximation, 174
  and Green's function, 148
  for localized impurity problem, 167
  and non-Hermitian operators, 149
"Reduced" model theory, 4, 183
  application to electronic paramagnetic resonance spectroscopy, 323
  auxiliary variables, 447
  and chemical reaction rate, 439
  and gene frequency, 479
  and hydrogen bond, dynamics, 286
  irrelevent variables, 7, 447
  linear limit, 189
  linear one-dimensional system, 227
  linear version, 18, 20
  microscopic basis, 239
  and multidimensional variables, 25
  non-linear version, 25
  and phenomenological Langevin equation, 63
  and stochastic Liouville equation, 203
    equivalency to, 323
  structural constraints, 189
  structure, 211
  systematic approach to, 43
  use in liquid state molecular dynamics, 184
  virtual variables, 62
Reequilibrium process, 210
Relaxation:
  molecular, 430
  process, 4
  spin, 184
  superoperator, 104
  theory of, *see* Theory of relaxation
Relaxation moment problem, 103
Relaxation operator, 96
  non-Hermitian, 116
Relaxation time, 46
  as activation time, 471
  and effective potential, 489
  evaluation by continued fraction procedure, 471
Renormalization techniques, 177
Reorientational diffusion, 357
Repulsive potential barrier, 263
Residual circuit force, 468
Reverse transformation, 57
Rise and fall transients, 188
  in fluorochloroacetonitrile, 220
Rise transient, dispersion of, 201
Rotation:
  Brownian motion, 70
  diffusion coefficient, 300
  dynamics, 246, 261, 290
  equation of motion, 271
  generators, 71
  kinetic energy, 262
  two-dimensional, numerical solution of Kramer's equation for, 187
  velocity, 199
Rotation-translation coupling, 186, 219, 269
Rototranslational signatures, 198
Running time average, 194

Salpeter mass function, 497
Scalar product, 10, 110
  definition, 23
  formal, 116
Scattering:
  incoherent inelastic, 202
  multiple, 173
  theories, 172
Schrödinger equation, 135
  for impure crystal, 163

Schrödinger representation, 2, 10
Second-order fluctuation equation, 32
Second-order phase-locked loops, 186
Selection equilibrium, 481
Selection intensity, fluctuations, 477, 479
Self-excited oscillator, 451
Self-gravitating system, 499
Self-organizing living systems, 478
Semiconductors, 186
Separation theorem, 116
S-fraction, 85
  approximants, 86
  and J-fraction, 89
Short-time region, 472
Simpson's integration rule, 234
Simulated rise transients, 194
Singer's algorithm, 271
Sinusoidal potential, 245
Site symmetry, 220
Smoluchowski equation, 30
  correction to, 33, 70
Smolukowsky operator, 370
Solar nebula, 495
Solar system, synthetic, 496
Solar system formation, 495–496
  low-mass protosolar nebula models, 495
Solids:
  defects in, 163
  electronic structure, 138
Soliton diffusion, 190
Solvent interactions, in condensed phase reactions, 389
Spatial variables, 241
Specific heat, 294
Spectral density, 101, 125, 139
Spectral moments, 321
Spherical harmonics, 337
  and order parameter, 365
Spherical top, 73
Spin angular momentum, 349
Spin degeneracy, 165
Spin Hamiltonian, 334
Spin relaxation, 184
Spin reorientational relaxation process, 385
Spin-rotation nuclear magnetic relaxation, 191
Spin-spin NMR, 202
Star:
  age of, 497
  breeding, 518
  clusters, 497
  models, 498
  formation, 497–502
    binary system formation, 501
    distribution function, 497
    gradients, 504
    initial mass function, 497
    and interstellar gas content, 507
    mass spectrum, 497
    multiple system, 502
    as percolation phenomena, 503
    and rotational velocity, 504
    time dependence, 498
  low-mass, 500
  motion of, 515
Static dielectric constant, 170
Static magnetic field, 336
  and ESR spectra, 358
Stationary equilibrium distribution, 70
Statistical mechanics, nonlinear nonequilibrium, 2
Statistical stellar dynamics, 493
Stellar atmospheres, 493
Stellar combustion, 519
Stellar formation, 493
Stellar population, probability distribution function, 509
Stellar systems:
  dynamics, 493
  and magnetic fields, 499
  and turbulence, 499
Stieltjes moment problem, 96
Stieltjes-Lebesgue integral, 110
Stieltjes transform, 102
trans-Stilbene, photoisomerization, 431
Stochastic angular acceleration, 185
Stochastic differential equation, 21, 186
Stochastic equations, 186
  nonlinearity, 207
  reduced model theory analysis, 478
Stochastic forces, 5
  definition, 30
  intensity, 29
Stochastic linear oscillator, 446
Stochastic Liouville equation, 203, 323
Stochastic multiplicative process, 63
Stochastic noise, 445
  additive, 447, 461
  Gaussian noise, 445
  influence on equilibrium properties, 461
  multiplicative, 445, 460
  noise variance, 451

Stochastic oscillator, 211
Stochastic processes:
  in astrophysics, 493–529
  multiplicative, 34, 203
Stochastic torques, 287
Stochastic variable, 23, 187
Stokes' law, 430
Stratonovich algorithm, 446
Streak camera detection system, 211
Structural perturbation, 263
Sturm sequence, 114
Subharmonic oscillator, 451
Super-Burnett coefficient, 309
Superionic conductors, 186
Superlattices, 134, 170
Superoperator, 96
Suzuki method, 211
  mean field approximation, 255
Synergism between inertia and multiplicative fluctuations, 407
Synthetic solar system, 496
Systematic evolutionary pressures, 477

Taylor power series, 46
Tchebycheff polynomials, 114
Theoretical population genetics, 479
Theory of relaxation:
  and continued fraction, 81–132
  and J-fraction, 88
  memory function approach, 81
Thermal equilibrium, 34
Time autocorrelation function, 190
Time-convolution integral, 32
Time evolution, 12
Time-reversal symmetry, 202
Time-scale separation, 42
Torque, 190
  imposed, 196
Torsional oscillatory motion, 189
Transformation law, 386
Transient(s):
  amplitude, 202
  average, 192
  correlation function, 210
  field dependence, 221
  field-on condition, 203
  induced by alternating fields, 200
  induced birefringence, 191
  oscillations, 202
  second-order, 202
Transition metals, electronic structure, 139
Transition state theory, 390
  assumptions, 391
  and friction, 395
  partition function, 391
  rate expression, 391
  in solution chemistry, 391
  validation limits, 395
Translational diffusion, 304
Translational velocity, 24
Translation vector, 138
Transmission coefficient, 391
Tridiagonal matrix, 119
Triplet zero-field splitting, 334, 348
T Tauri stars, 500
Tunable gap compounds, 176
Tunnel diode, 450
Turbulence, and star formation, 500
Turbulence theory, 494
Two-dimensional disk-annulus itinerant oscillator, 187
Two-dimensional system:
  applied field, 265
  computer simulation for, 261
  orientation structure, 265

Unitary transformation, 57
Unit operator, 102
Unit vectors, 196
Universe, galactic population, 494

Vacuum tube oscillator, 450
Valence bands, 135
Van Hove function, 304
Van Hove singularities, 135
Variables:
  dimensionless, 421
  fast-relaxing, 64
  irrelevant, 5
    adiabatic assumption, 8
  relevant, 1
  time independent, 2
Velocity autocorrelation function, 228
Velocity correlation functions, time behavior, 232
Velocity distribution:
  galactocentric position, 493
  variations, 493
Velocity and space, 30
Verlet algorithm, 234
Virtual crystal approximation, 173
Virtual dipole, 207